Translation

PATENT COOPERATION TREATY

PCT/CH2003/000624

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference NT 001-P/WO	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/CH2003/000624	International filing date (*day/month/year*) 16 September 2003 (16.09.2003)	Priority date (*day/month/year*) 11 November 2002 (11.11.2002)
International Patent Classification (IPC) or national classification and IPC C09C 1/00		
Applicant BÜHLER AG et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 12 sheets, as follows:

      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I Basis of the report

   ☐ Box No. II Priority

   ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☐ Box No. IV Lack of unity of invention

   ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI Certain documents cited

   ☐ Box No. VII Certain defects in the international application

   ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 15 March 2004 (15.03.2004)	Date of completion of this report 03 December 2004 (03.12.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/CH2003/000624

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☒ The international application as originally filed/furnished

☒ the description:

pages 1, 4, 5, 8-17, as originally filed/furnished

pages* 2, 2a, 3, 3a, 6, 7 received by this Authority on 29 July 2004 (29.07.2004)

pages* _____ received by this Authority on _____

☒ the claims:

pages _____, as originally filed/furnished

pages* _____, as amended (together with any statement) under Article 19

pages* 1-40 received by this Authority on 29 July 2004 (29.07.2004)

pages* _____ received by this Authority on _____

☐ the drawings:

pages 1/3-3/3, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/CH 03/00624

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-40	YES
	Claims		NO
Inventive step (IS)	Claims	1-40	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-40	YES
	Claims		NO

2. Citations and explanations

1) **This report makes reference to the following documents:**

D1: US-A-5 912 767 (LEE ROBERT ARTHUR) 15 June 1999 (199-06-15)

D2: US-B1-6 168 100 (KATSUMATA TAKATOSHI ET AL) 2 January 2001 (2001-01-02)

D3: US-A-6 068 691 (BENOIT DENNIS R ET AL) 30 May 2000 (2000-05-30)

D4: EP-A-0 952 009 (TOYOTA MOTOR CO LTD) 27 October 1999 (1999-10-27)

D5: US-B1-6 242 510 (KILLEY EDWARD J) 5 June 2001 (2001-06-05)

D6: US-B1-6 344 245 (KAY RALPH) 5 February 2002 (2002-02-05)

D7: US 2003/129404 A1 (BRADLEY RICHARD A ET AL) 10 July 2003 (2003-07-10)

D8: US-A-3 957 354 (KNOP KARL) 18 May 1976 (1976-05-18), mentioned in the application

D9: US-A-4 434 010 (ASH GARY) 28 February 1984 (1984-02-28), mentioned in the application.

D1 (US5912767) discloses diffractive elements which can be used, for example, in optically variable inks

(OVI), for holographic images, or in adhesives. Each element consists of a thin film with a diffractive pattern printed on one or both sides thereof. The elements are 30 µm or less in size, and therefore they have the typical dimensions of pigment flakes. The diffractive patterns consist of grooves or geometrically shaped indentations. The diffractive structures can be applied in the form of concentric circular patterns or concentric polygonal grooves. Figures 1 and 2 show different diffractive elements. Figure 1 shows a diffractive element having different areas, each of which contains different diffractive patterns that generate different diffractive effects depending on the viewing angle. In figure 2, a thin film is embossed with concentric circular grooves spaced at a distance of 0.4 to 0.6 µm.

D2 (US6168100) discloses embossed metal pigment flakes used as holographic pigments. Their average size falls in the range of 25 to 50 µm, and their thickness in the range of 0.4 to 1 µm. Figure 9 shows a metal film that is embossed on both sides and then ground into flakes. The metal film can be an aluminum film, for example. The metal flakes can be optionally coated with an acryl melamine resin.

D3 (US6068691) discloses embossed flake-shaped metal pigments used in printing inks and coatings, for example in the form of holograms for security documents. The production method involves embossing at least one surface of a carrier layer, which is then metallized in order to form an embossed metal film (thickness: 100-500 angstroms, which equals 0.01-0.05 µm), which is in turn ground into pigment

flakes (size: 25-50 µm). The diffraction patterns can be diffractive or holographic patterns. Example 1 describes this type of aluminum pigment.

D4 (EP0952009) discloses holographic pigments (particle size: 5-50 µm, thickness: 0.3-5 µm) with an embossed pattern. The production process includes applying a resin layer to an embossed carrier plate, drawing off the resin film, applying a thin metal film to the embossed resin surface, and then grinding.

D5 (US6242510) discloses adhesive labels consisting of a polymer medium and embossed, diffractive flakes. The flakes can be made of aluminum and are 50-100 µm long and 9-12 µm thick.

D6 (US6344245) discloses security documents, the production process of which differs from that in the application only in that the final step does not involve the grinding of the embossed metal film. The metal film can contain holograms or diffraction patterns in the UV wavelength range.

2) Novelty - PCT Article 33(1) and (2)

Novelty is recognized for independent claims 1 and 23, since none of the documents D1-D9 discloses the feature of the epitaxial application of the sealing means. Furthermore, novelty is also recognized for claims 2-22 and 24-40, which either are dependent on claim 1 or claim 23, respectively, or refer thereto.

3) Inventive step - PCT Article 33(1) and (3)

The problem to be solved by the present application can be regarded as that of providing a pigment that generates color effects by means of diffraction. The solution consists in providing a pigment with a surface area having a defined diffractive structure that generates diffractive effects, for example holograms, in the UV and/or visible wavelength range. Furthermore, the pigment has an inner diffractive structure surrounded by an epitaxially applied sealing material.

None of the cited documents discloses the feature of the epitaxial application of the sealing material, and the prior art does not suggest any possible advantages of this method. Therefore, the Examining Authority is of the opinion that epitaxy is not a standard application method that a person skilled in the art would select without thereby being inventive. Consequently, inventive step is recognized for the subject matter of claims 1-40.